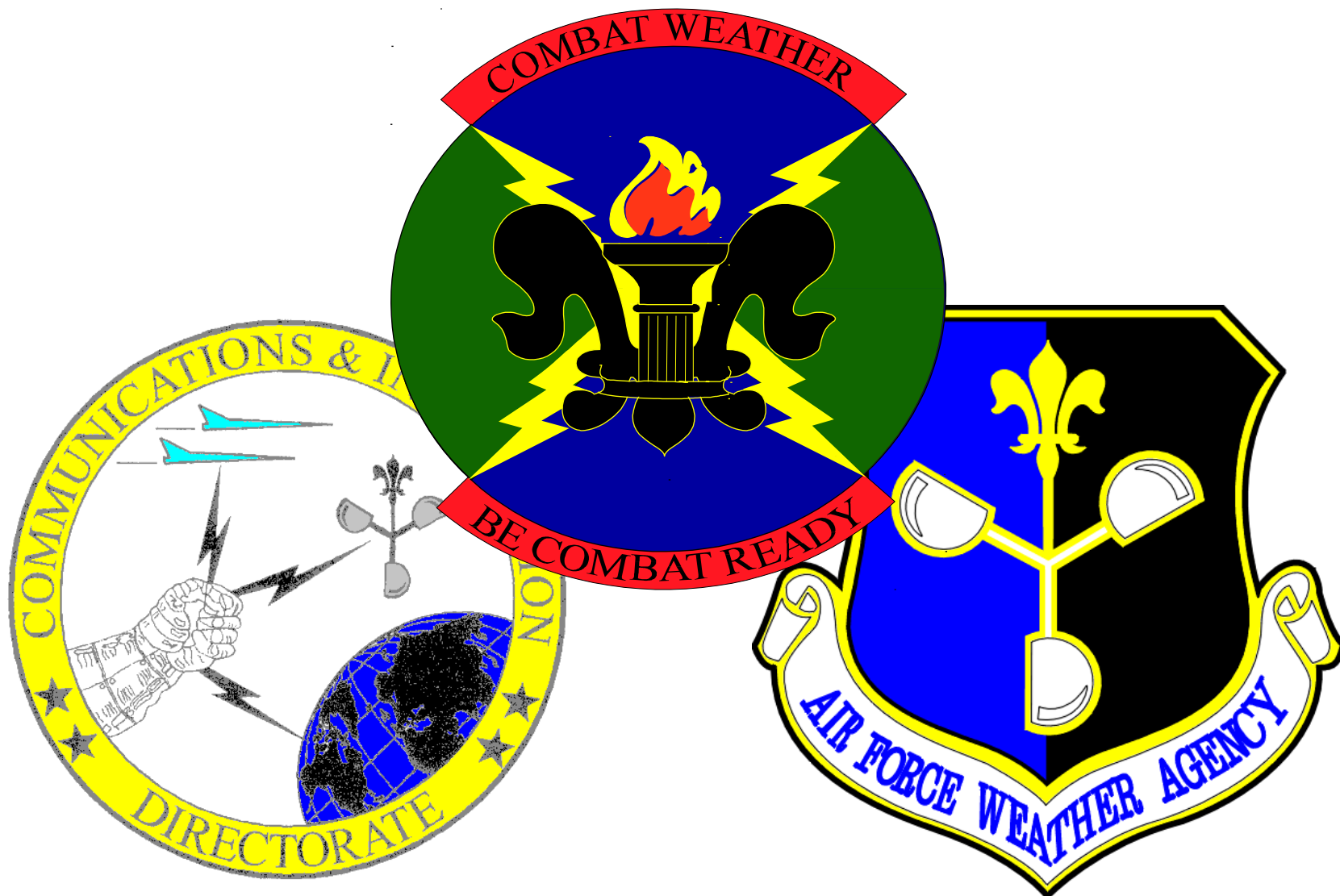


“Choose The Weather For Battle”



AFCWC sets up TVSAT in MOPP 4 gear
to evaluate ease of set up



Training Overview

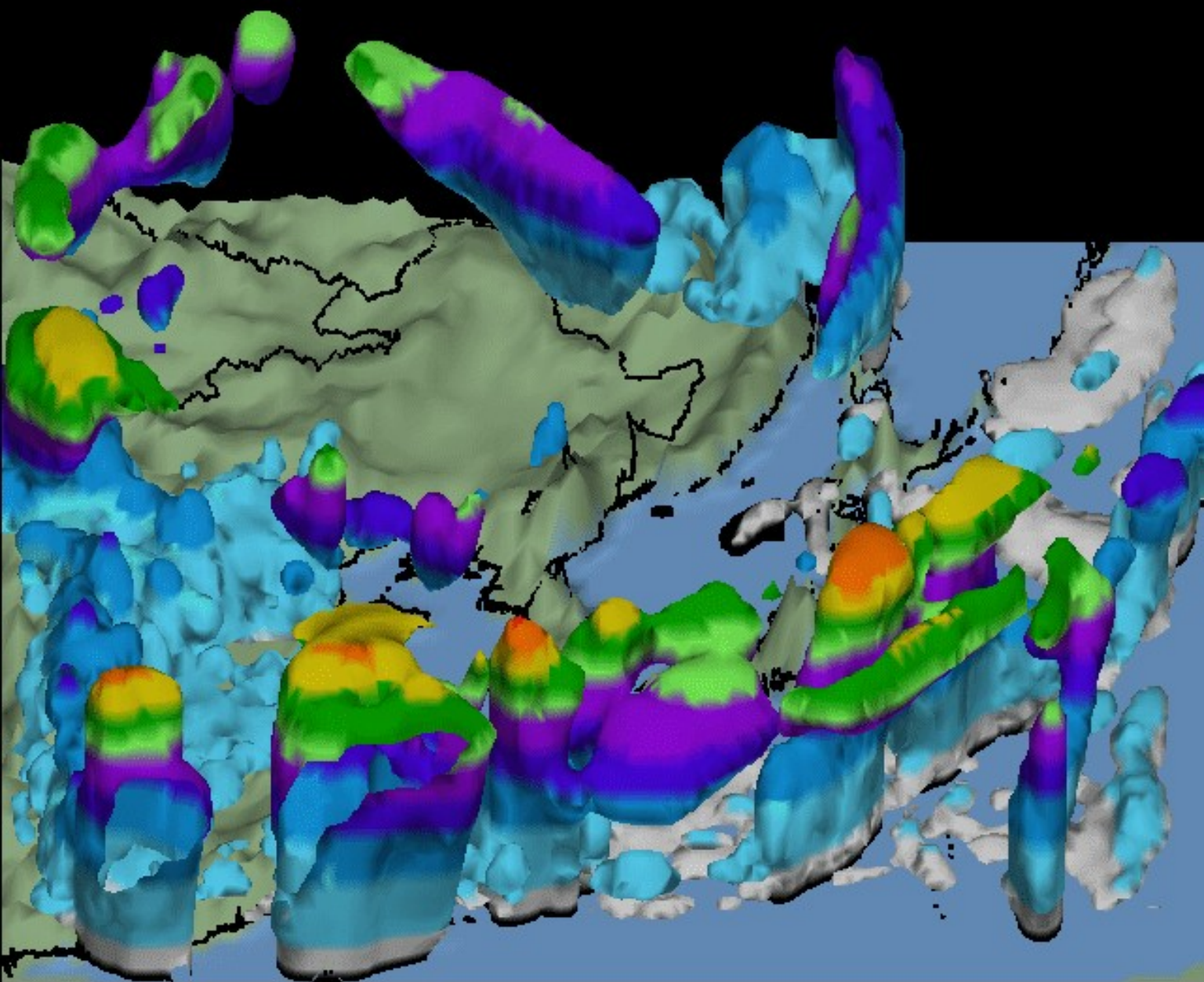
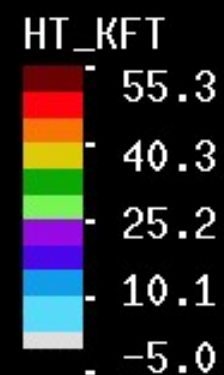


- Description of System
 - Operating Characteristics
 - System Components
 - Setup Time
 - External Connections

Air Force
Weather
Agency

9 of 17
0600Z
20 May 98
Wednesday

MM5
Model Time
98051906Z



(MSL)Cloud Water

Vis5D

Training Overview



- Description of System
- Maintenance Procedures
 - Troubleshooting on site
 - AFWA assistance
 - AFWA resources

Training Overview



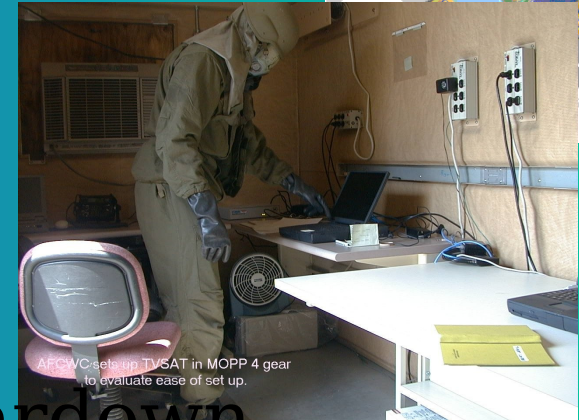
- Description of System
- Maintenance Procedures
- Satellite Communications



Training Overview



- Description of System
- Maintenance Procedures
- Satellite Communications
- Setup, Operation, and Teardown



Operating Characteristics



IDI

~~Extreme Heat~~

~~Extreme Cold~~

NORSAT

Prodelin

Raytheon

HNS

Kencast

~~Rough Handling~~

Operating Characteristics



- **T-VSAT Computer and Satellite Receiver**
 - Temperature: 0 to +38 degrees Celsius
 - Relative Humidity: < 90% non-condensing
- **Low Noise Block Down-Converter (LNB)**
 - Temperature: -40 to +60 degrees Celsius
 - Relative Humidity: 0 to 100%
- **Point: Keep T-VSAT computer equipment cool**
- **Point: Keep T-VSAT computer equipment dry**

System Components

- 1.0 meter reflector
- Low noise block down-converters (LNB) for CONUS, Europe, and WestPac
- 300 Mhz Gateway 2000 Laptop Computer
- Docking Station with network interface control (NIC)
- IP Relay Satellite Receiver
- Additional NIC card
- Coaxial and 10 Base T cables
- Satellite Finder-Meter
- Tactical case with foam dividers



Setup Time



- 15-20 Minutes
- Data receipt starts immediately after setup!



External Connections



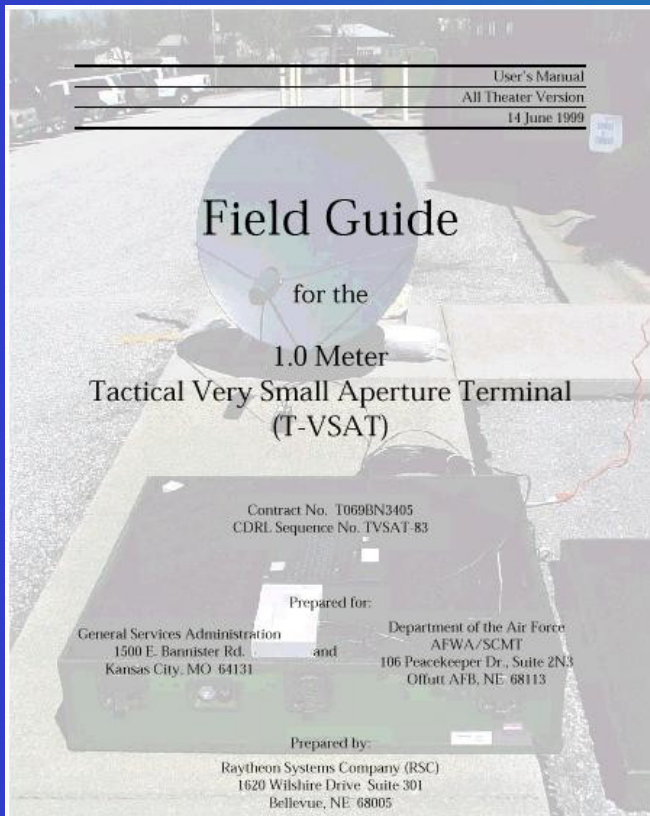
- T-VSAT is a communications system
- Weather information received as files
- Files can be transmitted to other systems
 - IMETS
 - AMIS
 - Other computers
- In a tactical scenario, these other systems rely on the T-VSAT for data

Maintenance Procedures



- Troubleshooting on site
- AFWA assistance
- AFWA resources

Troubleshooting on Site



T-VSAT on-line Software Manuals Microsoft Internet Explorer

File Edit View Go Favorites Help

Back Forward Stop Refresh Home Search Favorites History Channels Fullscreen Mail Print Edit

Address D:\My Documents\VSAT\Training\VSAT Training Documents\web\vch_sw_help_top.htm

T-VSAT on-line Manuals Index

[Return to Descriptions](#)

T-VSAT Comm Handler

- [T-VSAT Field Guide](#)
- [T-VSAT Deployment Guide](#)
- [VCH User's Guide](#)
- [VCH Administrator's Guide](#)
- [VCH Directory Structure](#)

T-VSAT Web Site Software

- [Apache Documentation](#)
- [T-VSAT Web Directories](#)
- [Web Viewing Software](#)

T-VSAT FTP Server

- [WFTPD Documentation](#)
- [FTP Server Configuration](#)

T-VSAT Satellite Software

- [Fazzt Remote Packager](#)
- [Fazzt Remote Station Guide](#)

COTS Helper Applications

- [Acrobat Reader Manual](#)
- [Diskeeper Manual](#)

T-VSAT on-line Software Manuals

Select links at left to view T-VSAT Software Manuals

T-VSAT Comm Handler:

T-VSAT Field Guide	Display the <i>T-VSAT Field Guide</i>
T-VSAT Deployment Guide	Display the <i>T-VSAT Preparing to Deploy Guide</i>
VCH User's Guide	Display the <i>VCH User's Guide</i>
VCH Administrator's Guide	Display the <i>VCH System Administrator's Guide</i>
VCH Directory Structure	Display information on the VCH Directory Structure

T-VSAT Web Site Software:

Apache Documentation	Display the <i>Apache</i> Web Server on-line Documentation
T-VSAT Web Directories	Display information on the T-VSAT Web Site Directory Structure
Web Viewing Software	Display information on configuring the web browser

T-VSAT FTP Server:

WFTPD Documentation	Display the <i>WFTPD</i> FTP Server on-line Manual
FTP Server Configuration	Display information on the FTP Server Operation and Configuration

T-VSAT Satellite Down Link Software:

Fazzt Remote Packager	Display the <i>Fazzt Remote Packager</i> on-line Documentation
Fazzt Remote Station	Display the <i>Fazzt Remote Station</i> on-line Documentation Guide

AFWA Assistance

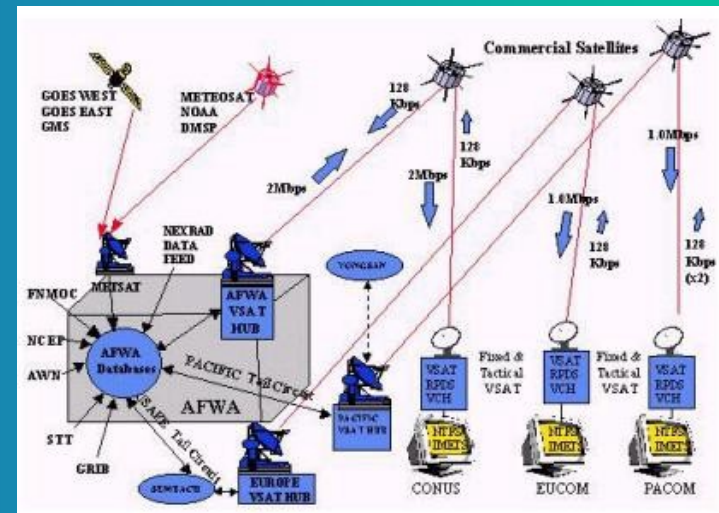
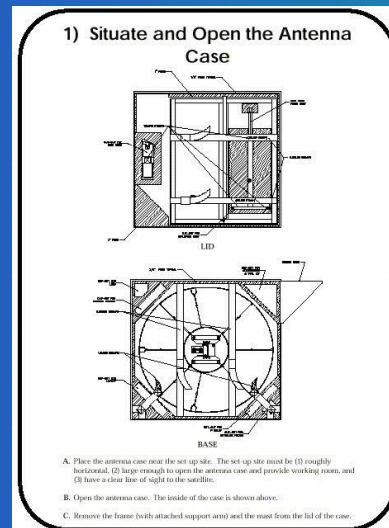
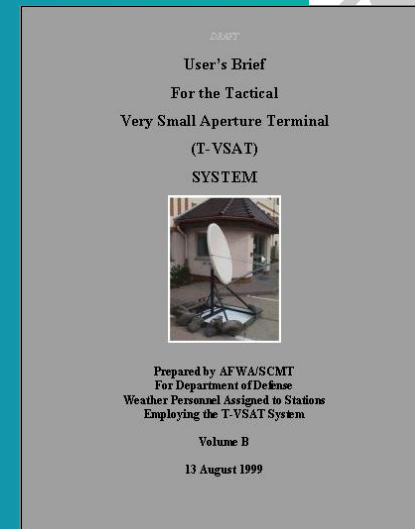


- Consolidated Help Desk
 - DSN 271-2586
 - Commercial (402) 294-2586
 - VSAT and T-VSAT Trained
 - 24/7 Support
- T-VSAT Contractor Logistics Support
 - Over-the-phone troubleshooting
 - Ships parts to you upon component failure

AFWA Resources



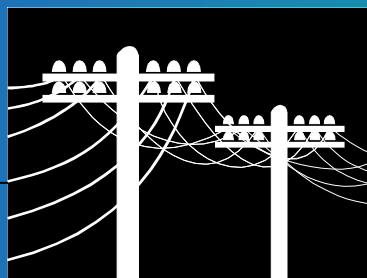
- VSAT Web Page
 - Technical Notes
 - Diagrams and Illustrations
 - Extended Troubleshooting
 - System Descriptions
 - <http://wwwmil.offutt.af.mil/afwa>



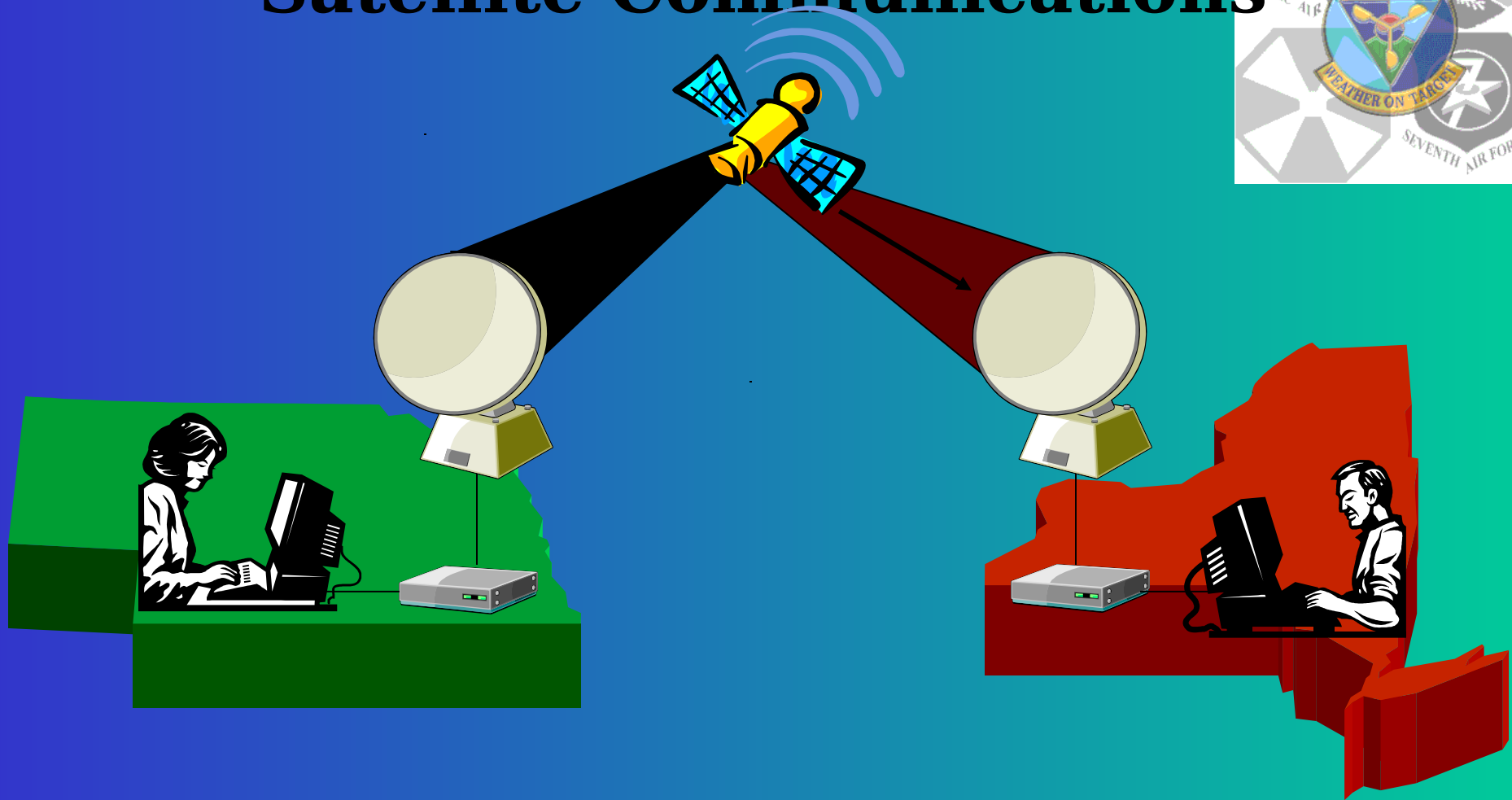
Basic Satellite Communications



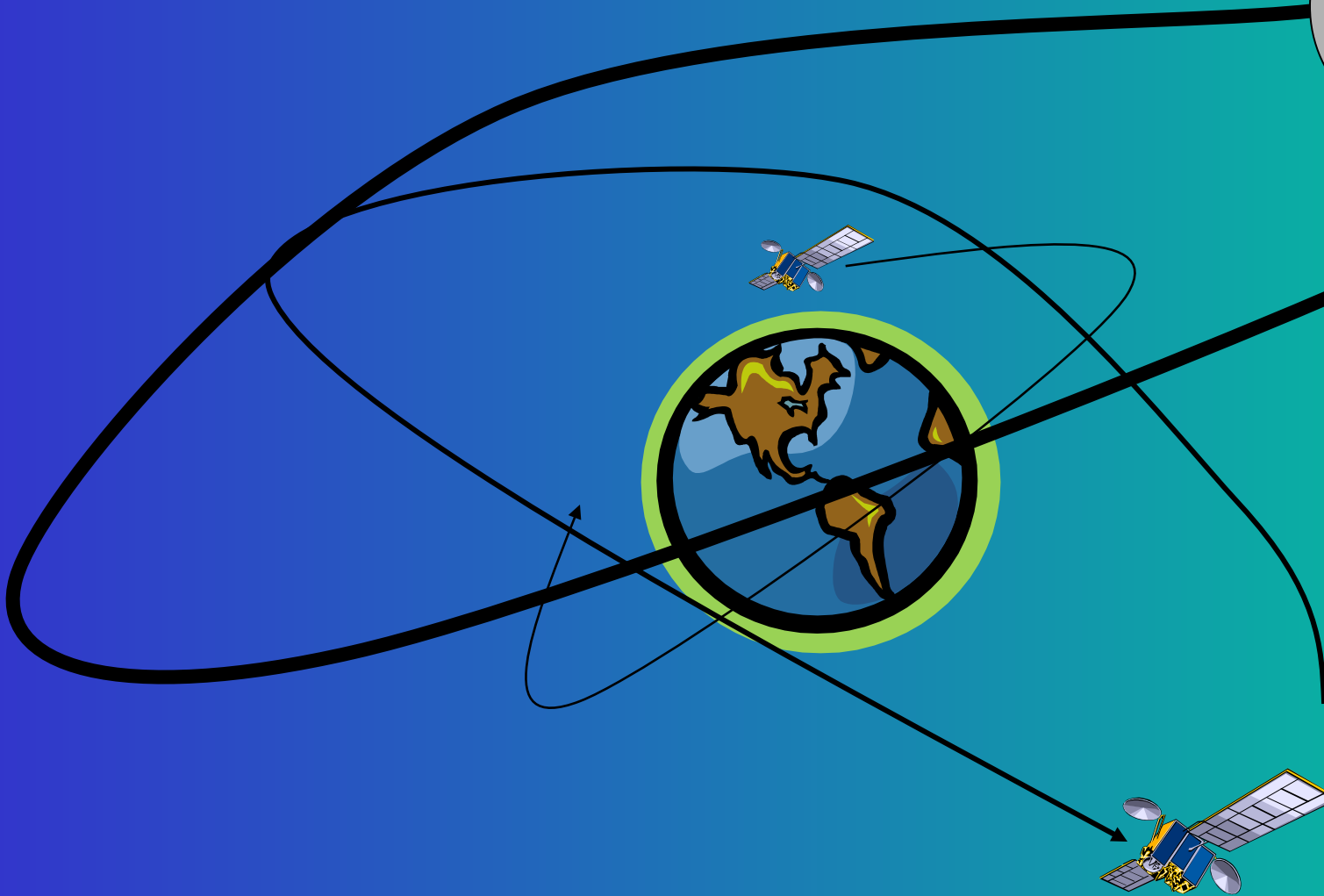
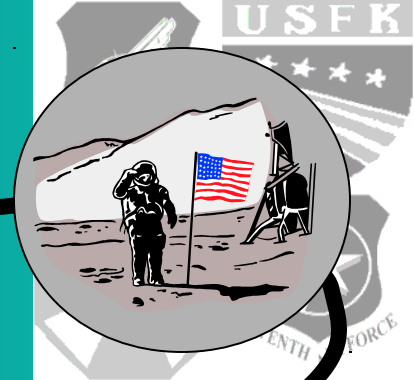
Communications Circuits



Satellite Communications



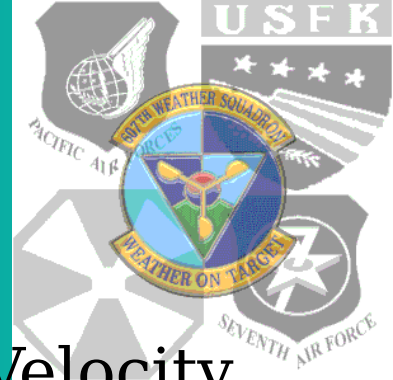
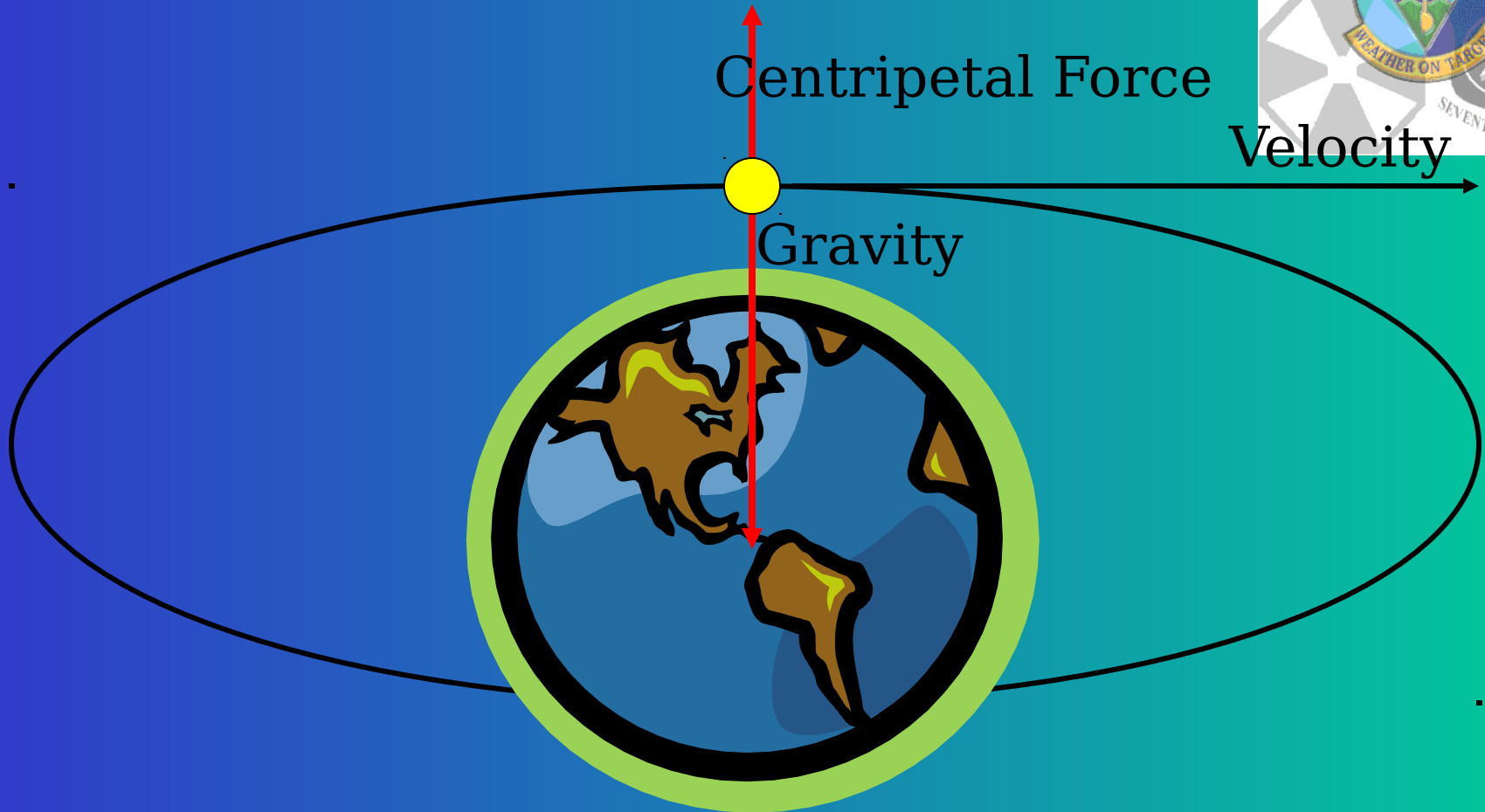
Satellites



Satellite Movements



Satellites in Orbit



Geostationary Satellites



1 orbit in 24 hours



22,300 miles

Above the equator

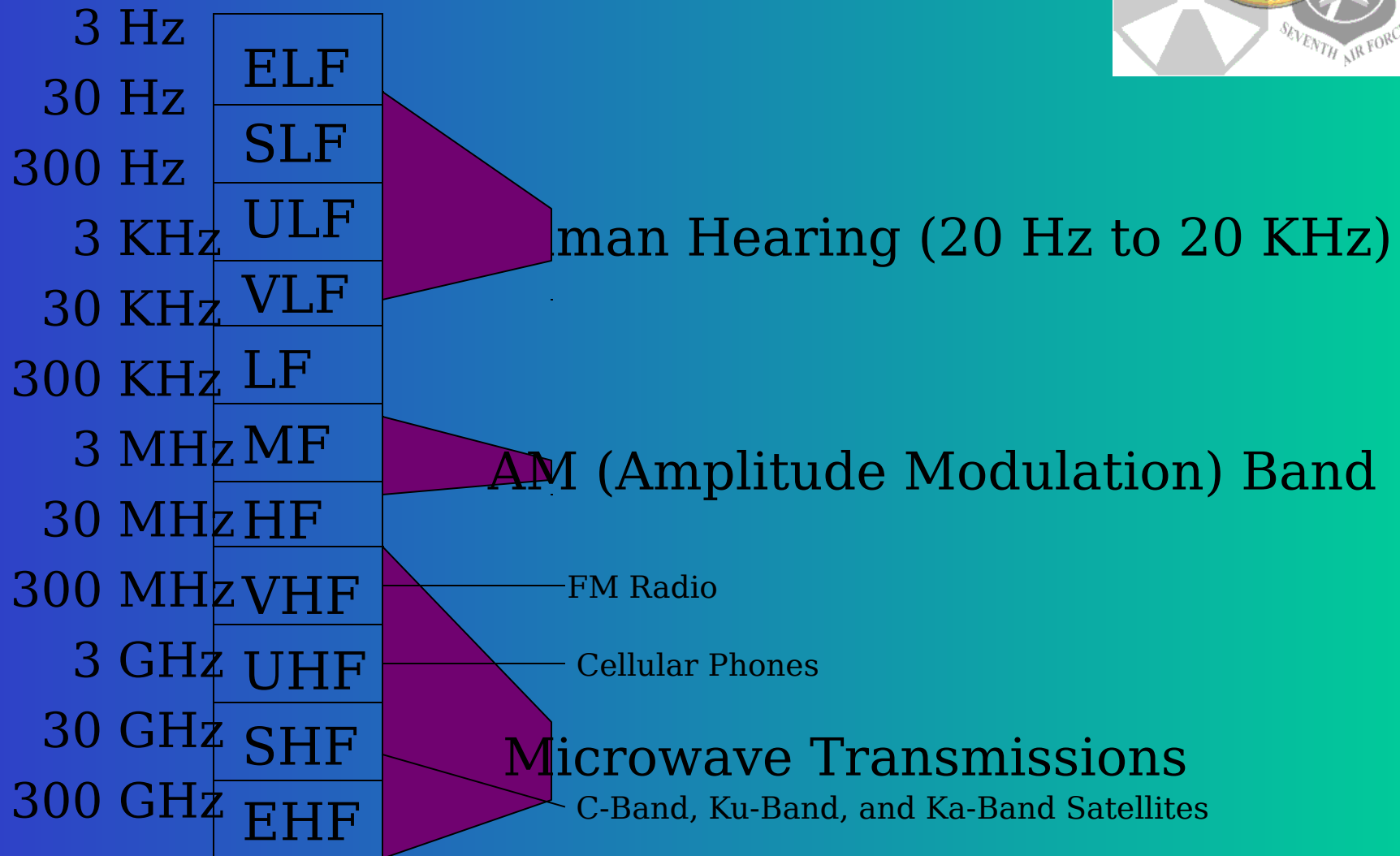
Site points to satellite that appears to be unmoving compared to the ground.

Lack of Coverage at the Poles

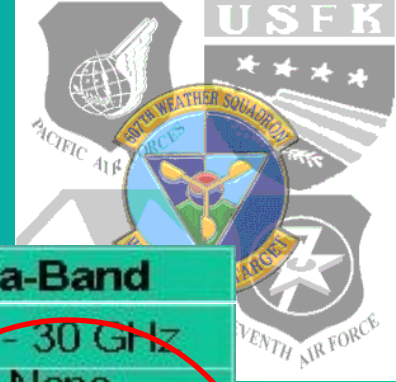
No coverage region



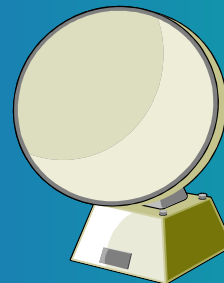
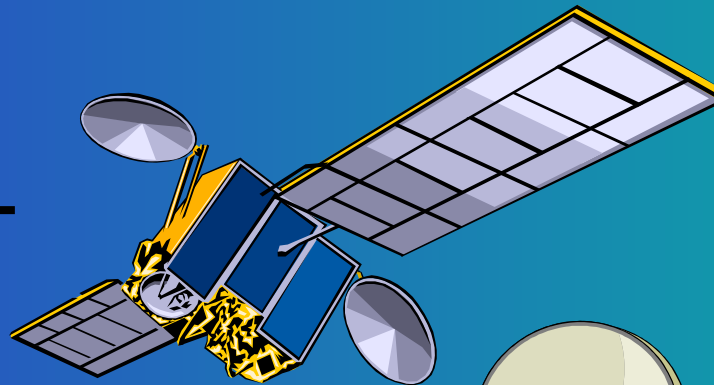
Radio Frequency Spectrum



Microwave Frequencies



	C-Band	Ku-Band	Ka-Band
Frequency Range	4 - 6 GHz	10 - 14 GHz	24 - 30 GHz
Shared With	Terrestrial Microwave	None	None
Wavelength	Short	Very Short	Extremely Short
Weather	No Effect	Some Effect	Great Effect
Antenna Size	Large	Medium	Small
Spatial Separation	4 Degrees	2 Degrees	1 Degree
Coverage Areas	Hemispheric (large)	Continental (med)	Country (small)
Throughput	Low	Medium	High



Rain Fade



- Microwaves are affected by water.
- The shorter the wavelength the more the effect
- Microwave ovens heat by exciting water molecules
- Microwaves from satellites are bouncing off water molecules a
- The more water molecules, the more signal loss



CONUS Space Segment (GE-1)



GE-1 Typical Ku-band

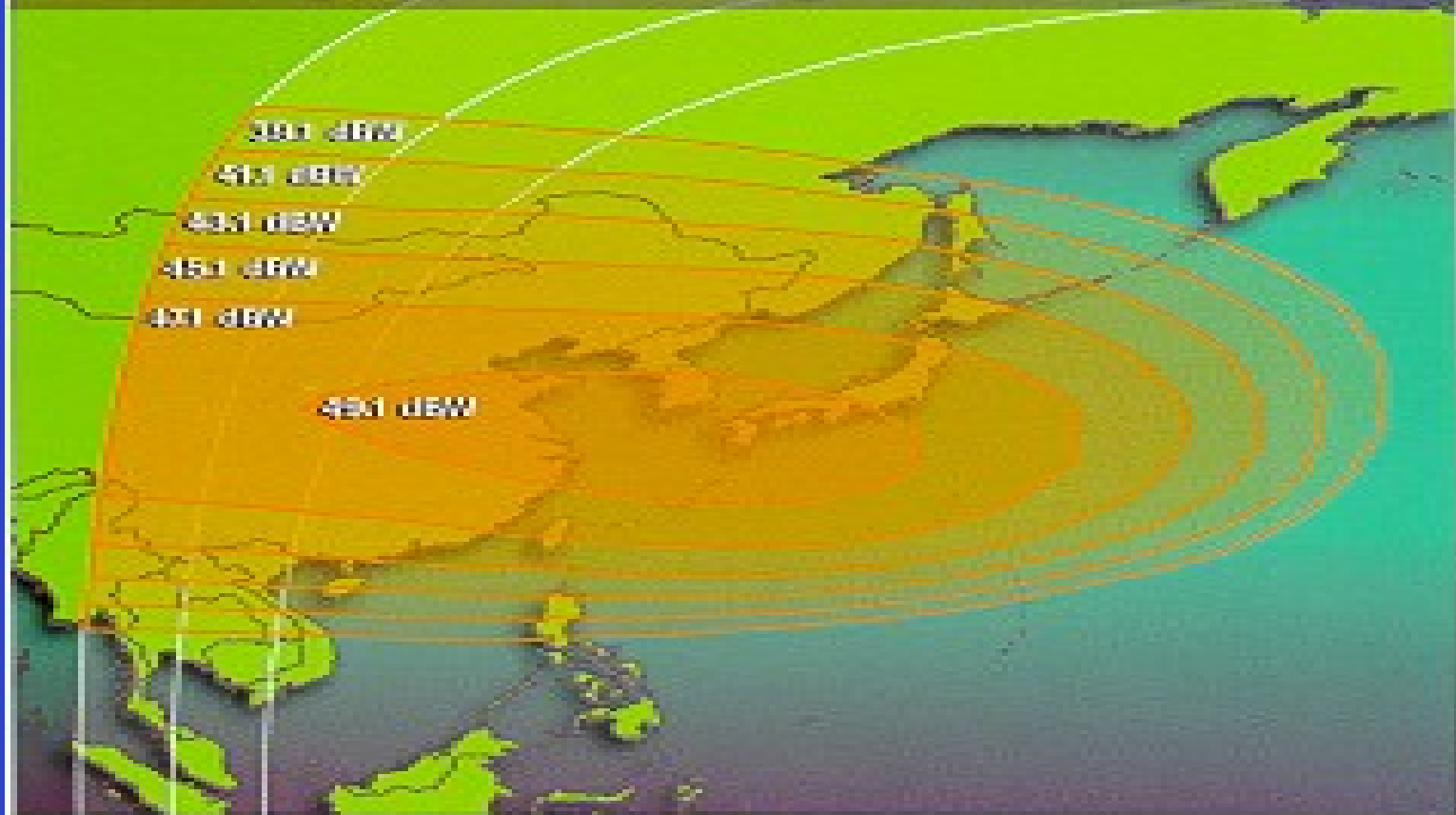


North America EIRP performance

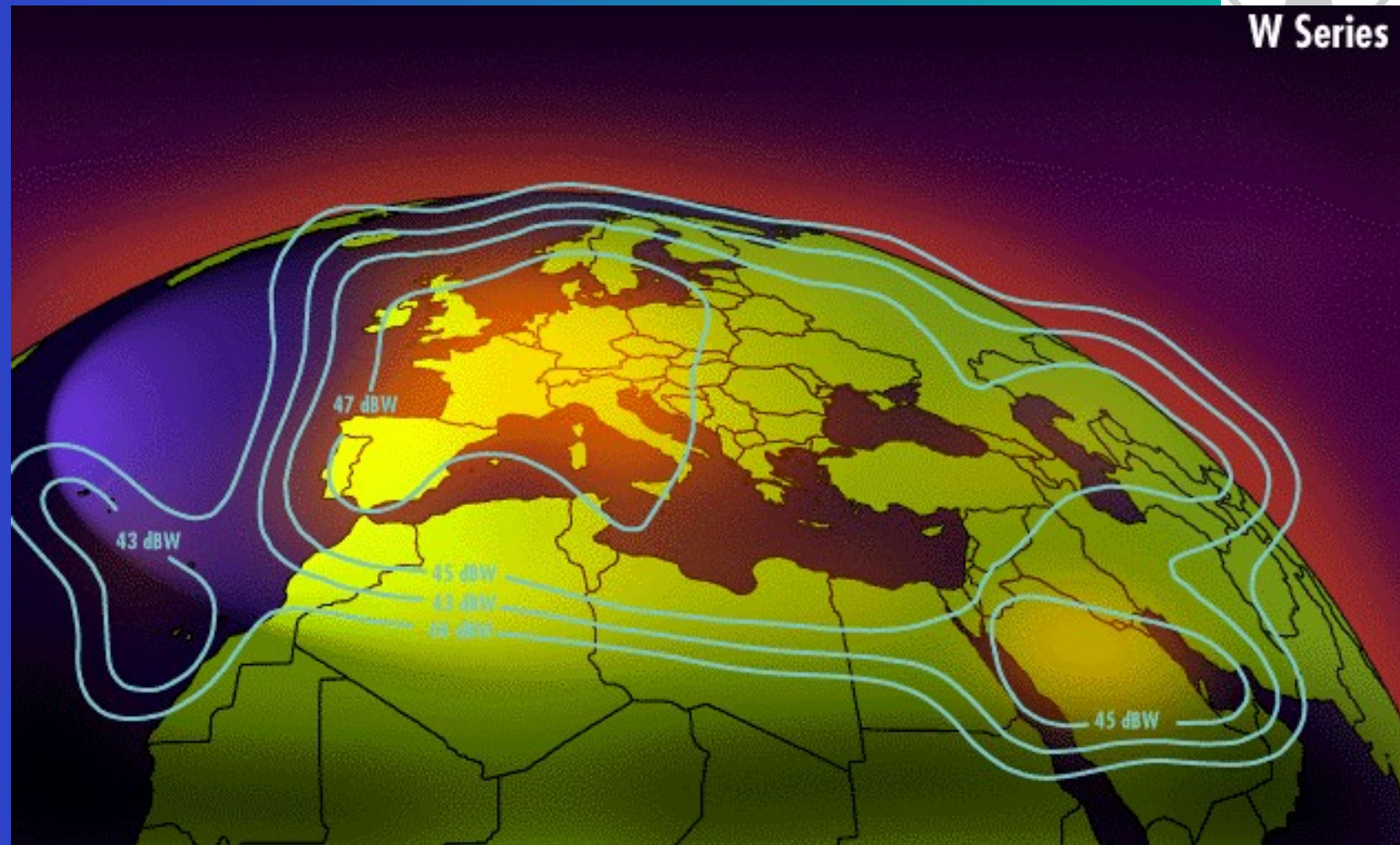
Western Pacific Space Segment (Intelsat 702)



Ku-Band Spot 2 Beam Peak up to 50.1 dBW (50W)



Europe & Southwest Asia Space Segment (Eutelsat W3)



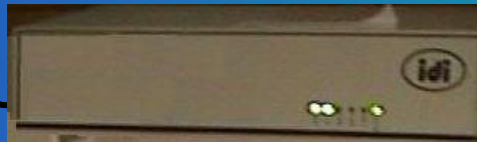
Receiving the Broadcast



2. LNB
sends data
to Satellite
Receiver

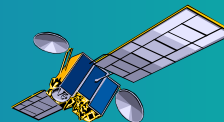
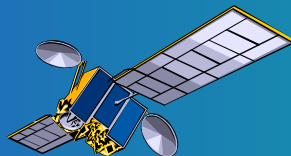
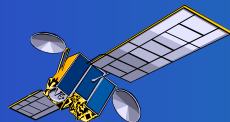


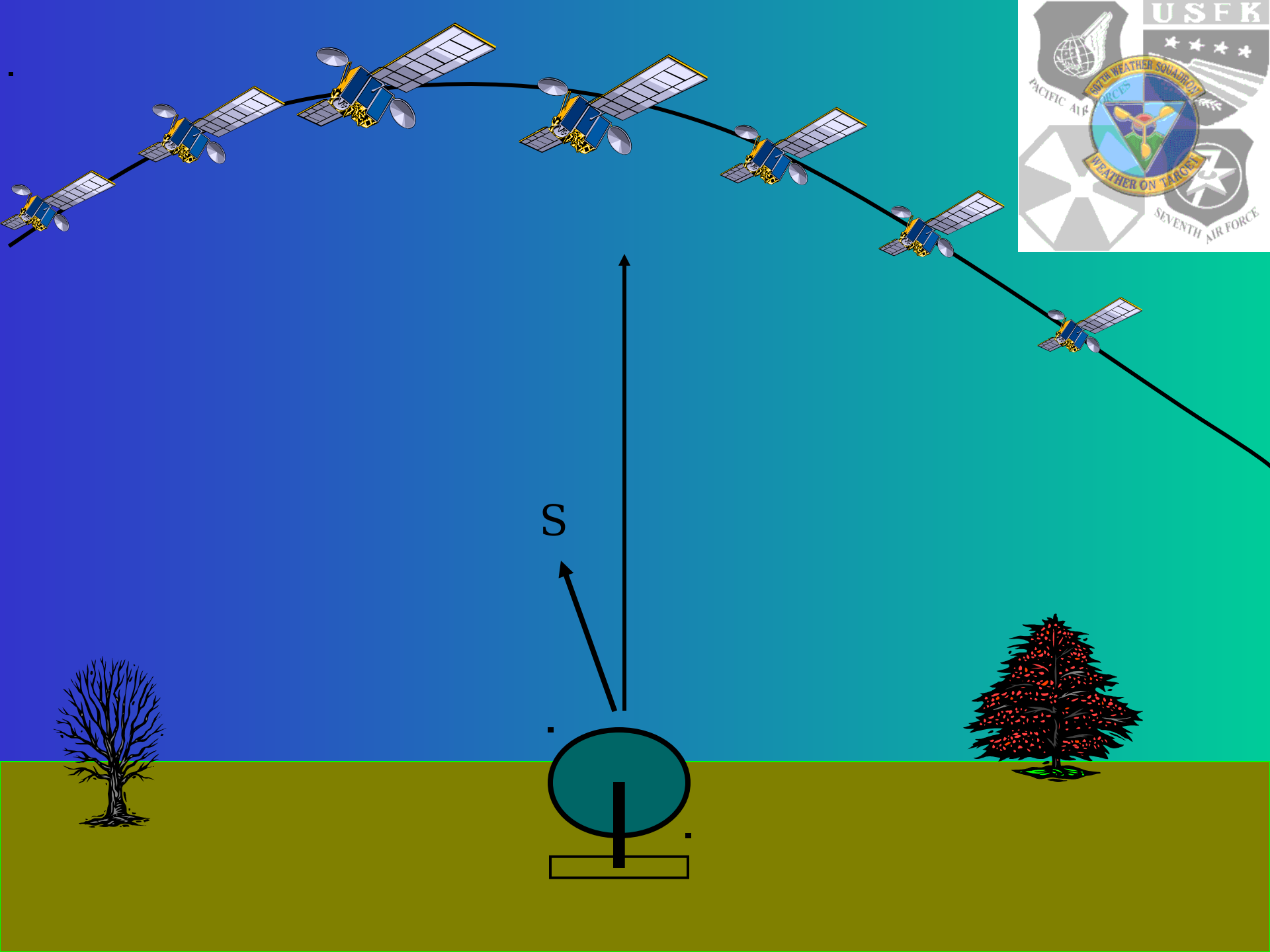
1. Satellite dish collects
microwaves and sends to LNB



3. IP Relay Receiver converts
to baseband and sends to your
T-VSAT computer







Training Overview



- Description of System
- Maintenance Procedures
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TACTICAL VSAT

